Cuban Boa Helps to Maintain Ecosystem Balance at Guantánamo Bay

Navy & Toledo Zoo Team Studies Reproduction of Cuba's Largest Predator

RESEARCHERS FROM THE Naval Facilities Engineering Command (NAVFAC) Atlantic, NAVFAC Southeast, and the Toledo Zoo are studying the demographics of the Cuban boa to develop a species management plan for Naval Station (NS) Guantánamo Bay.

Living on the rocky hillsides and grassy slopes of NS Guantánamo Bay is a large snake species (up to 15 feet long) that serves a key role in maintaining ecosystem balance. The Cuban boa (*Chilabothrus angulifer*) is the top predator in this ecosystem and understanding its population dynamics and reproductive biology directly supports the military mission by providing a healthy ecosystem for military testing and training.

Researchers from NAVFAC Southeast, NAVFAC Atlantic, the Toledo Zoo, and the NS Guantanamo Bay Environmental Department take a special interest in ensuring the boa's future on the Station. They have completed a long-term radio-telemetry study on Cuban boa habitat use and movement patterns, and are now tackling the more difficult problems of determining the population dynamics of NS Guantánamo Bay Cuban boas, especially the population density and its trajectory toward expansion or decline. Using this information, along with data from their prior research, they will develop a management plan for the Cuban boa to ensure its continued survival on the Station. The unique advantages of NS Guantánamo Bay, such as large tracts of undisturbed habitat, active protection of wildlife, and veterinary support, make collection of this information feasible.

Cuban boas may live more than 30 years in the wild and the reproductive potential of large females, which are rare in Cuba outside the fence line, is

Naval Station Guantánamo Bay.

not known. As females reproduce no more often than once every two years and take five or more years to mature, it takes a long-term research commitment to collect the data necessary to understand the life history parameters and demographic trends that allow modeling of Cuban boa populations. A variety of factors determine the population dynamics of the Cuban boa including: age at first reproduction, reproductive interval, litter size, survivorship, and other factors relating to the demographics of the population. The combination of Command and Joint Task Force buy-in, partnership synergy, and shared financial and logistical support has made this effort possible.

Cuban boas court and mate on the Station from mid-April to early June and, although females mate biennially, males are capable of reproducing every year and seek out new females when their preferred females are unreceptive. Males, several of which may compete for attention of the same female simultaneously often exhibit ritualized male combat, a form of body wrestling in which males attempt to push each other to the ground or dislodge a competitor from contact with a female. After the dominance of a particular male is established, he uses his pelvic spurs

Peter Tolson from the Toledo Zoo wrangles a large gravid (pregnant) Cuban boa prior to its examination.
NS Guantánamo Bay Public Affairs Office

For More Information

For more information about efforts to use technology to collect habitat and movement pattern data on the Cuban boa aboard NS Guantánamo Bay, read our article "Toledo Zoo & Navy Partner to Study Cuban Boa: Researchers Use GIS & Other Technology to Collect Biological Data" from the winter 2007 issue of *Currents*. An electronic copy of this article is available from Bruce McCaffrey, our managing editor, at brucemccaffrey@sbcglobal.net or 773-376-6200.

A gravid female Cuban boa emerges from a NS Guantánamo Bay grassland.
Peter Tolson

(vestigial legs) and body contact to stimulate the female and induce her to mate. The courtship process may take as long as two or three weeks. As in many other snake species, mate selection is the prerogative of the female, and researchers have observed several instances of mate fidelity over the years. Boa mating at NS Guantánamo Bay has been observed in abandoned structures, grasslands, or even burrows of the Cuban rock iguana (*Cyclura nubila*).

Cuban boas do not lay eggs. The young are born alive in September and October; gestation takes between 150 and 180 days and is dependent on the temperatures the female is exposed to during her pregnancy. Normally the female will seek out a sunny spot in the grass or in a forest clearing in late afternoon or mid-morning to bask in the sun and elevate her body temperature.

Researchers at NS Guantánamo Bay have collected reproductive data from females with body masses from seven to 45 pounds and ranging from five to more than 12 feet

Two large Cuban boas mate in an abandoned bunker.
Peter Tolson

A bag containing 18 Cuban boa babies is prepared for release back into the wild.
Peter Tolson

ABOVE: A single litter of Cuban boas born in October 2014. Note the associated placentas and yolk sacs.

LEFT: A Cuban boa neonate being weighed at the NS Guantánamo Bay veterinary clinic.

Peter Tolson

in total length and have learned quite a bit already about Cuban boa reproductive strategies. Larger females not only give birth to larger litters (up to 20 babies) than smaller females, but their babies are also significantly longer and heavier than those born to smaller females. This means that females become more reproductively valuable as they grow older and larger, and a 20-year-old female has the reproductive potential to produce more than 100 very large babies during her reproductive life. This many offspring is crucial because fewer than one in ten of them will survive their first year, most dying from starvation or predation by feral cats or birds of prey. Snakes in populated areas of NS Guantánamo Bay also face the threat of vehicle strikes. Fourteen percent of the 51 boas researchers have tracked on the Station have been killed on the road.

The death of a large female in her reproductive prime, whether by feral dog attack or by a speeding car, creates a significant tear in the ecological fabric of the Station. The greatest such loss known on NS Guantánamo Bay occurred when a 15-foot, 11-inch female was run over by a truck in 1989. This enormous female would have produced more than 30 babies every other year.

The Cuban boa is a tremendous ally in controlling the large population of Desmarest's hutias, a keystone species on the Station. Hutias are critical to the overall ecology of the Station, but they can also become a nuisance, impeding military readiness by chewing through vehicle wiring, fiber-optic cables, and water lines. They also contribute to erosion and the subsequent sedimentation of coral reefs by devouring entire stands of trees. Young boas are also predators of the exotic rats and mice that can infest military and residential areas. By devouring these rodent pests, the Cuban boa has become essential in maintaining the healthy landscapes needed to support long-term military testing, training, and national security requirements on NS Guantánamo Bay. ⚓

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